



INCLUSIVE SUSY TRIGGER @ $2 * 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$



(The end of) September milestone

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- Generic SUSY : multijet + (leptons) + E_T^{miss} events
- 2 mSUGRA points are available for low-lumi study
 - $M_{\text{SUSY}} \sim 500$ (just beyond Tevatron II reach) and 1000 GeV
 - $m(\tilde{g}) \cong m(\tilde{q})$
 - $\tan \beta = 10$ ("preferred")
 - $\mu > 0$ - the sign doesn't play a big role

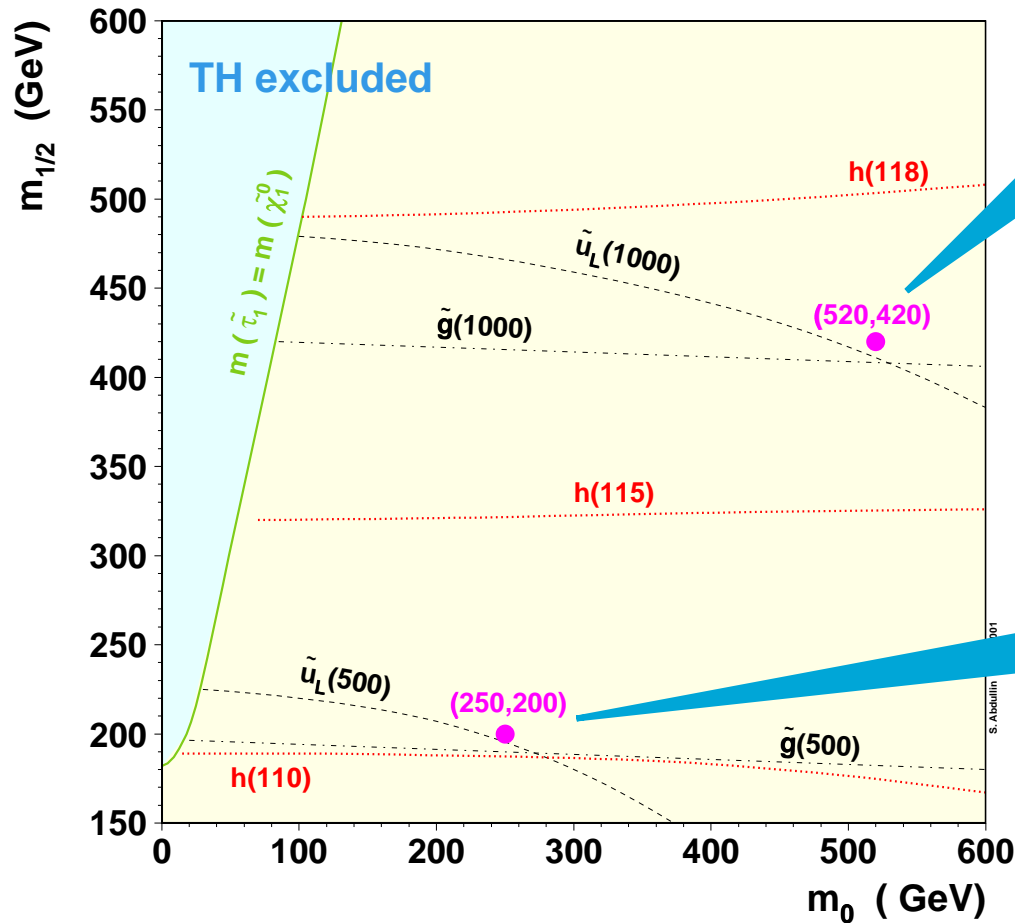




PROBING POINTS



$A_0 = 0, \tan\beta = 10, \mu < 0$



$m(\tilde{\chi}_1^0) = 177.5 \text{ GeV}$ $m(h) = 116.8 \text{ GeV}$

$m(\tilde{t}_1) = 726 \text{ GeV}$

$\sigma = 2.24 \text{ pb}$, requires $\int L dt < 100 \text{ pb}^{-1}$

typical cuts :

$E_T > 300 \text{ GeV}, N_j \geq 4$

$E_T^j > 200, 100, 50 \text{ GeV}$

$m(\tilde{\chi}_1^0) = 79.0 \text{ GeV}$ $m(h) = 110.7 \text{ GeV}$

$m(\tilde{t}_1) = 352 \text{ GeV}$

$\sigma = 115 \text{ pb}$, requires $\int L dt < 10 \text{ pb}^{-1}$

typical cuts :

$E_T > 150 \text{ GeV}, N_j \geq 3$

$E_T^j > 100, 50, 50 \text{ GeV}$

■ Cuts efficiency for the signal : 20 - 50 % (0.5 - 1 TeV)



MORE PROBING POINTS ?



- Inclusive SUSY signatures (except some degenerated cases) have a kind of "compensating" effect due to multi-particle cascade decays
 - less jets -> harder jets
 - missing E_T slightly depends on internal mass hierarchy (lighter $\tilde{\chi}_1^0$ -> more boosted etc.)

- After cuts optimization the observability of inclusive SUSY signal depends mainly on the mass scale of strongly interacting sparticles (squarks and gluino)





ONLY THE SIGNAL ?



■ SM background for fairly low SUSY mass scale (0.5-1 TeV) :

- single(Wtb)/double top production,
 - multijet QCD (incl. $b\bar{b} + X$),
 - W/Z + multijets
- } comparable

■ 0.1 fb^{-1} would require

- Wj ~ 160,000 events
 - Zj ~ 60,000 events
- } $\hat{p}_T > 100 \text{ GeV}$
- $t\bar{t} \sim 80,000 \text{ events} +$
~ 30,000 for single top
 - QCD ~ $7 * 10^6 \text{ events}$
- } $\hat{p}_T > 200 \text{ GeV}$

■ Physics TDR challenge ?

